Cowichan Station Area Association

2375 Koksilah Road
Duncan, BC V9L 6M5
info@cowichanstation.org

Submission to the Old Growth Strategic Review – January 2020

About us

The Koksilah Watershed Working Group (KWG) operates as a subcommittee of the non-profit Cowichan Station Area Association in the Koksilah watershed, in the un-ceded territory of the Quw'utsun people.

The volunteer group is made up of Koksilah watershed residents with varying backgrounds, including forestry and fisheries professionals and academics, landowners, farmers, and local government representatives. The committee consults closely with Cowichan Tribes as well as Quw'utsun elders, chiefs and knowledge holders.

Our most recent endeavor has been to complete an independent ecosystem-based assessment of the Koksilah Watershed. The findings of the report, as well as relevant published scientific studies and the experience and expertise of our community members, inform the following submission.

Preamble

The land of the Koksilah watershed was occupied since before memory by the Quw'utsun people who recognized that future generations had a stake in the forests, waters, fish and other animals as well as the plant-life of their territory. The land with its abundance sustained many generations over thousands of years. This changed when the European settlers came and confiscated, without treaty, the Quw'utsun lands.

The rapid settlement of the Cowichan Valley, including the 30,000 ha Koksilah watershed, changed many of the ecosystems over a short period of time. For example, although 80% of the Koksilah watershed is forest land, by 2018 only 1,200 ha of old forests remained due to extensive logging and land clearing. Of this, 300 ha (<1% of the watershed) is known to be old growth, that is, at least 250 years old (Pritchard et al., 2019. Ecosystem,-based assessment of the Koksilah River Watershed; Phase 1 report: watershed character and condition. Unpublished report of the Cowichan Station Area Association, BC).

The world is in a crisis with the rapid increase in atmospheric greenhouse gases resulting in unwanted climate change and an unprecedented decrease in biodiversity since human history started to be recorded. Protecting our remaining old growth forests,and promoting the maturation into old growth of a large fraction of our forest, can help counter many of these negative ecological changes.

Important Roles That Old Forests Play In The Health Of Our Planet

Forests and the Carbon Cycle: Old forests sequester large amounts of carbon dioxide. Historically, forests sequestered a large fraction of the carbon dioxide released into the atmosphere. Clearcutting converts forests from major sequesters of carbon dioxide to net producers of carbon dioxide. Today clearcutting of forests in BC results in the release of 42 million tonnes of carbon dioxide annually and at the same time reduces the ability of the forests to sequester carbon dioxide by 26.5 million tonnes per year; that is, a climate change impact greater than all of BC's official greenhouse gas production (Clearcut Carbon. December 2019, Sierra Club Report). And as can be seen below, healthy forests result in healthy streams and wetlands, and these wetlands sequester even more carbon dioxide than mature forests per unit area.

Conclusion: Retention and increase in area of old forests is important for BC's Climate Strategy.

Forests and Hydrology: Old forests are important transient stores of winter precipitation. Mature forests on mountain tops retain snow longer than clearcuts: snow in forests melts slowly as the weather warms resulting in cool water entering the streams that feed the river. Forest floors with fallen trees hold water that is slowly released once the winter rains stop, thereby supplying trees with water in the summer, replenishing aquifers and feeding streams. Downed trees on the forest floor have been shown to hold 25 times the amount of moisture as the same volume of forest soil (B. Marcot. 2017. Ecosystem processes related to wood decay. *USDA Research Note.* PNW-RN- 576. 44 pp.) The hydrological importance of old forests has also been shown by the fact that a Douglas-fir forest that is 40 years old has 50% lower stream flow in summer than forests that are 150 to 500 years old (T.D. Perry & J.A. Jones. 2017. Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA. *Ecohydrology*, **10(2):** e1790).

The lower ability of clearcuts and young forests to transiently store water is dramatically seen in the Figure 2 which is taken from: R. Winkler *et al.* 2017. Streamflow response to clear-cut logging on British Columbia's Okanagon Plateau. *Ecohydrology* **10(2):** e1836. Clearcutting had little effect on total annual streamflow water volume flow. However, what clearcutting does do is increase the creek waterflow during the rainy season and decrease water flow during the dry

season. This effect is amplified by the amount of clearcutting. What this figure shows is the importance of older forest floors in acting as a temporary water storage device.

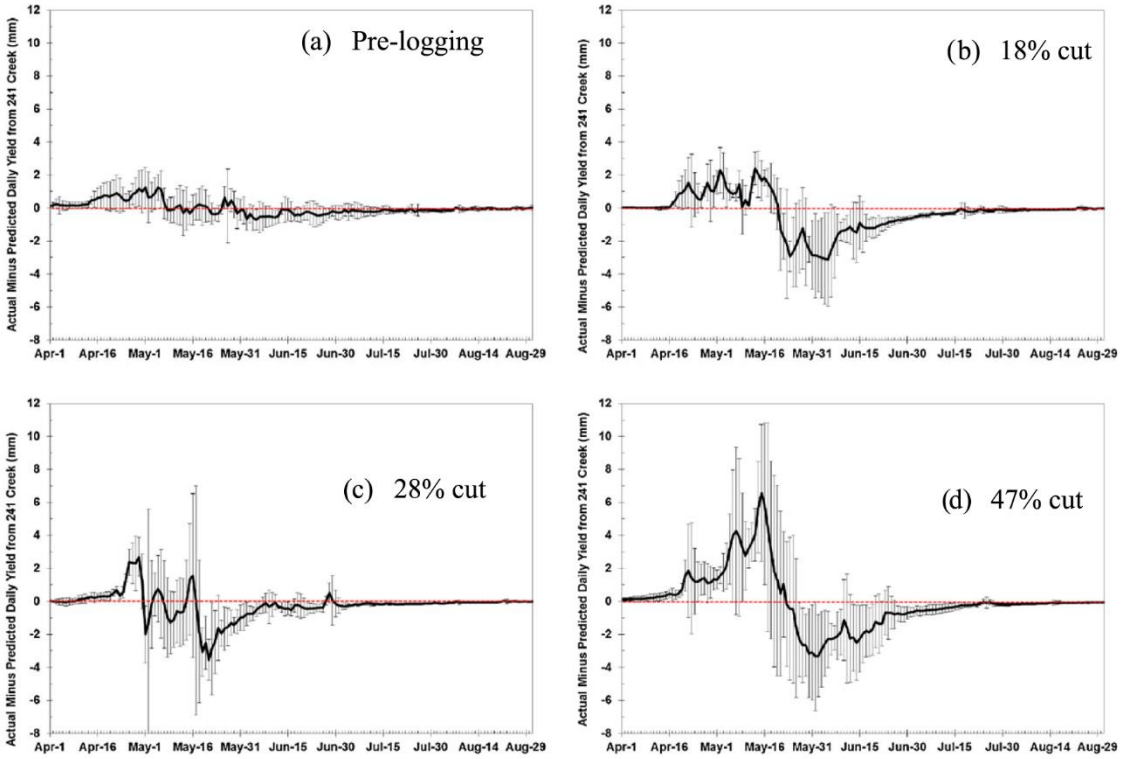

Figure 1: This is taken from Winkler *et al.* 2017 (Figure 7 of Winkler *et al.* 2017). It shows deviation of actual stream flow volume (solid black line) from predicted stream volume flow (stippled red line) in the Creek 241 watershed before clearcutting and at times following different extents of clearcutting. Before clearcutting there is little difference between actual flow and predicted flow, but this changes with clearcutting. The start of the study is 1986 and the end is 2014.

Figure 1 educates us on what has happened in the Cowichan River and Koksilah River watersheds since the time of European settlement began. The conversion of old growth forests through clearcutting results in more of the winter rains rapidly running into the ocean, thereby resulting in less of the water being stored in the forest floor and less water replenishing the aquifers. In contrast, during the dry season there is less water available to enter our streams and rivers. The reason for this is that there no longer is prolonged retention of snow and the forest floors store less water, resulting in less water for streams and rivers. This creates a habitat crisis for fish and all other creatures that directly or indirectly rely upon the habitat of streams and rivers. This also results in less water available to replenish our aquifers. This past summer we saw that the Cowichan River had so little water flow that water needed to be pumped over the weir at Lake Cowichan and the use of water licences in the Koksilah watershed was temporarily suspended.

Conclusion: Old forests are important for the health of our streams, rivers, wetlands and aquifers.

Forests and Fish Habitats:

A 45-year study of the effects of clearcutting at Carnation Creek near Bamfield clearly shows the effects of clearcutting and emphasizes the need for older forests for the health of our salmon populations (P.J. Tschaplinski & R.G. Pike. 2017. Carnation Creek watershed experiment – long-term responses of coho salmon populations to historic forest practices. *Ecohydrology* **10(2):** e1812). The clearcutting effects included rises in summer stream water temperature and ambient summer air temperature coinciding with streamside logging as well as less stable streambed and loss of structural diversity and cover for fish. The Tschaplinski & Pike study has shown that 15 years after the clearcutting there was a progressive decline such that by 20 years following clearcutting only half of the number of smolts migrated to the sea compared to before logging started (Figure 2).

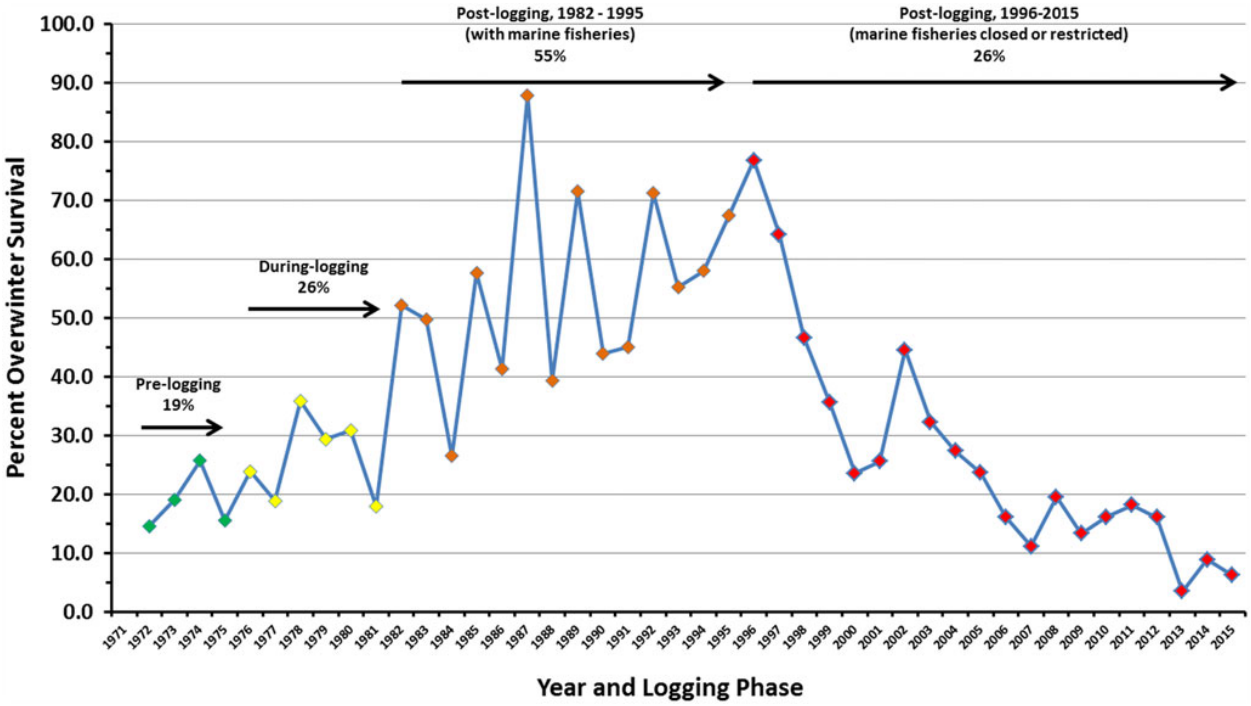

Figure 2. Percentage of juvenile coho salmon that survive the winter and migrate to the sea as smolts in the Tschaplinski & Pike study (2017. Carnation Creek watershed experiment – long-term responses of coho salmon populations to historic forest practices. *Ecohydrology* **10(2):** e1812). This figure forms Figure 12 in their manuscript.

In the Koksilah watershed, the value of the formerly strong salmon and steelhead fishery to Quw'utsun people is immeasurable. Where there was formerly a commercial fishery (valued in the high hundreds of thousands of dollars) targeting Koksilah Spring, Chum, and Pink salmon, there is now none. The formerly strong sport fishery for Steelhead salmon is now non-existent, as sport fishing in the river is now disallowed in the summer due to low flows and high temperatures. Members of our group and consulting elders recall with bittersweetness stories of fish caught and enjoyed by friends and family, given that current trends will ensure that future

generations will never again experience sport or sustenance-fishing from the Koksilah River as formerly.

Conclusion: Old forests are important for the health of fish populations, particularly anadromous fish such as salmon.

Forests and Biodiversity: We are currently in a crisis with many species threatened with extinction (Figure 3).

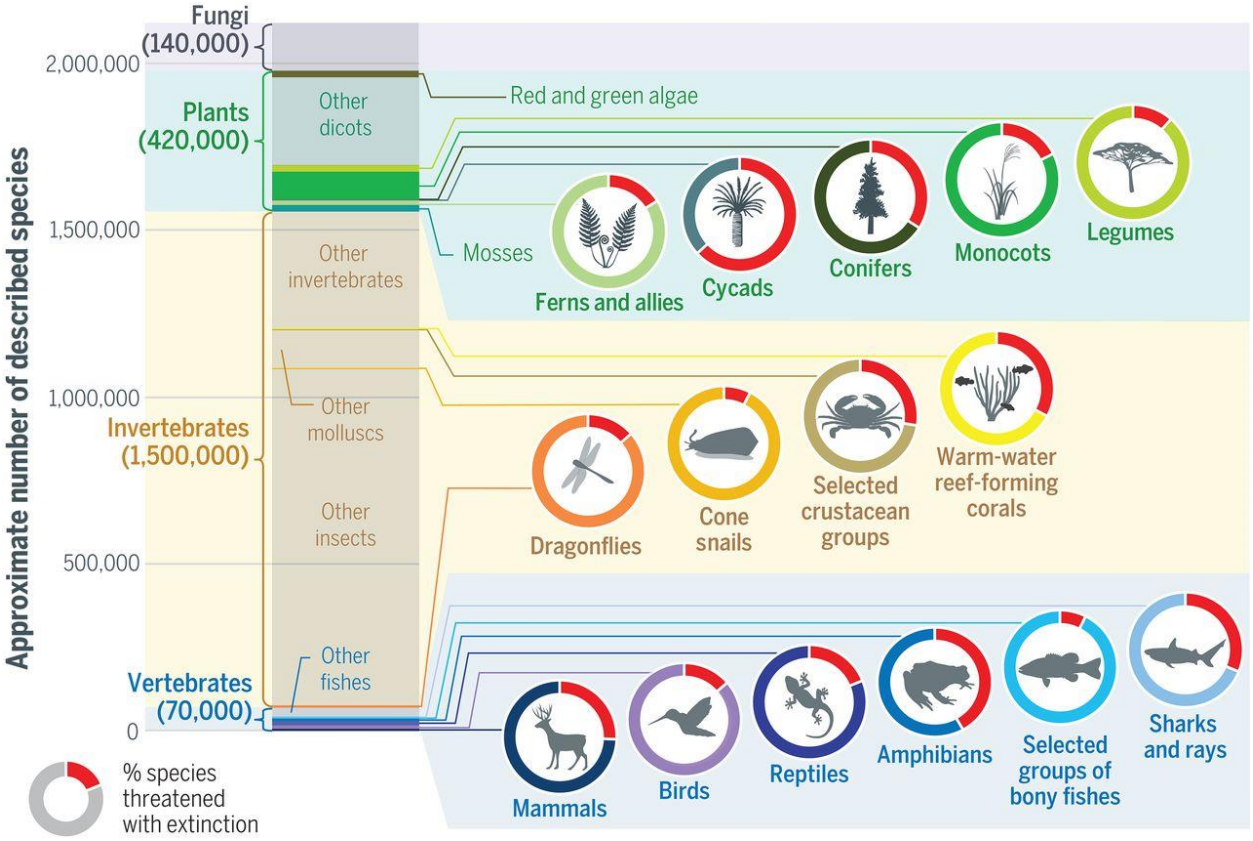

Figure 3. This figure is taken from S. Diaz *et al.* 2019. Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science* **366(6471):** eaax3100, 10pp). It illustrates the percentage of each group of living things are at risk of extinction (indicated by the red border).

Old forests form habitats for many creatures. We will provide a few examples only. Large snags, downed trees, and stumps of mature forests provide a nursery for new trees, shrubs, herbs and ferns (Marcot. 2017, *vide supra*). Snags, partially dead trees, rotting limbs and hollows in trees provide food for many creatures as well as nesting sites for many birds, winter hibernation sites for bears, etc., (Marcot. 2017).

Forests provide habitat for a number of endangered species. For example, the endangered Roosevelt Elk are primarily dwellers of old forests, avoiding open spaces but eating vegetation near forest edges such as riparian area, flood plains and meadows interspersed within the forest (K.T. Jenkins & E.E. Starkey. 1984. Habitat use by Roosevelt Elk in unmanaged forests of the Hoh Valley, Washington. *Journal of Wildlife Management* **48(2):** 642-646; J.F. Quayle & K.R. Brunt. 2003. Status of Roosevelt Elk (*Cervus elaphus roosevelti*) in British Columbia. *Wildlife Bulletin* **No. B-106**, 39 pp. Province of BC). Clearcutting decreases habitat resulting in Roosevelt Elk becoming nuisances for farmers.

Additional species at risk that depend upon mature and/or old growth forests include: the Marbled Murrelet that requires the canopy of old growth forests for nesting; the Red-legged Frog that required moist cool lower elevation forests; the Western Red-backed Salamander that requires mature and old growth forests for habitat. For more species at risk in BC see: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/species-ecosystems-at-risk/brochures.

Old forests also promote streams flowing during the dry season. Streams flowing in the dry periods are also important for maintaining our wetlands, including estuaries. Wetlands are the most efficient carbon sequestration ecosystems on the planet and its ecosystem is rich in biodiversity (P.A. Keddy et al. 2009. Wet and Wonderful: The World's largest wetlands are conservation priorities. *Bioscience* **59(1):** 39-51; D. Were *et al.* 2019. Carbon sequestration by wetlands: A critical review of enhancement measures for climate change mitigation. *Earth Systems and Environment* **3(2):** 327-340); hence, promoting wetlands combats climate change and promotes biodiversity.

Conclusion: Old growth and other old forests provide habitat for many creatures, a considerable number that are in danger of extinction. Old forests also promote healthy streams and rivers as well as wetlands. All of these are important in maintaining and promoting biodiversity in BC as well as in carbon sequestration.

Concluding Remarks

We, the current people alive in BC, are only temporary tenants of the land. We must take the attitude that the land belongs to future generations, human as well as non-human. Following the Province of British Columbia's commitment to reconciliation and to the principles of UNDRIP, we must take steps to return title and decision-making power to indigenous people.

We need legislation to change the law around fee simple. At the moment owning property in fee simple means one can do whatever one wishes with one's property subject to a few restrictions that may be imposed by local, provincial or federal governments. The land we occupy is a gift given to us, the living, by future unborn generations. It is time for the law to recognize that the land belongs not to us, the living, but to all future generations, human, non-human, animals and

plants. Land use that affects the ecological health of any region needs careful scrutiny before being approved.

All remaining old growth forests must be set aside and not be harvested. Also, importantly, a large fraction of mature forests, on both private and Crown land must be reserved from harvest to increase in time the overall area of old forests. This is necessary for promoting biodiversity as well as the health of our streams, rivers, wetlands and aquifers that in turn promotes biodiversity. We must change our forests from being net carbon dioxide emitters as they are now to their historical role of being carbon dioxide sequesters. The remaining forests, both Crown and private, need to be harvested following ecoforestry principles allowing minimal disturbances to streams, rivers, wetlands thereby promoting the replenishment of our aquifers and further promoting biodiversity.